

Ball Brooches in the Age of Citizen Science

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Abstract

Ball brooches make a difficult research theme in Denmark. This is mainly because very few of the hitherto published specimens were found in a context or under circumstances that help to shed light on their chronology. The most recently published study is a very brief paper by Jesper Laursen on the chronology and typology of ball brooches (Laursen 1984). Laursen's paper was published at a time when hobby metal detecting was only at its early stages in Denmark. Therefore, this hobby had not yet had its impact on the material. Metal detecting favors objects with much metal and since cultivated soil contains a lot of iron waste most hobby detectorists tend to screen for iron. Consequently, objects of bronze, silver and gold will have a tendency to dominate the finds brought in by these people, and especially massive objects. Thus, ball brooches, especially the cast bronze specimens, would have a good chance to be detected and collected. As the internet developed, some private sites were established where the finders themselves published their finds. Recently the app named DIME launched by University of Aarhus (in September 2018) and until today (29.09.2021) 121.186 finds have been registered by private users in the database. The newly available information, correlated with the previous ones, offers the possibility of a preliminary study of the ball brooches, which we propose in this article.

Keywords: Ball brooches; Denmark, chronology, typology, metal detecting.

Ball brooches make a difficult research theme in Denmark. This is mainly because very few of the hitherto published specimens were found in a context or under circumstances that help to shed light on their chronology. The most recent published Danish study is a very brief paper by Jesper Laursen¹ on the chronology and typology of ball brooches (Laursen 1984). In this treatise he divided the brooches into two major groups, group I: brooches of Middle-Latène construction, and group II: cast brooches (fig. 1). While the brooches in the first group may consist of iron or a combination of iron and bronze, the latter are almost exclusively made of bronze. Laursen proceeded to divide the second group into four subgroups, while the first group was divided into brooches with or without a cruciform depression on the balls. He further demonstrated that each subgroup had its own characteristic distribution (fig. 2), group I found

¹ Annette Bieger has later published an interregional study on ball brooches (Bieger 2003), but I chose to take the outset in Laursen's paper because it is regional and therefore more suited for comparison with the present dataset.

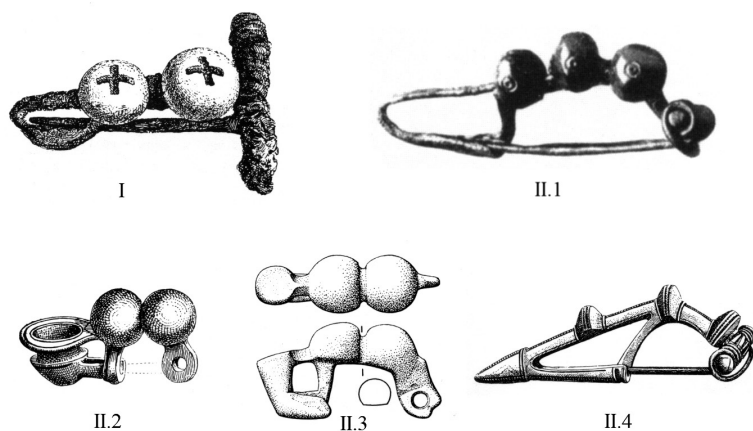


Fig. 1. The five types of ball brooches defined by Laursen 1984, figs. 2, 4, 5, 10, and 15.

primarily on Bornholm and the Zealand islands, while group two was found mainly on the Fyn archipelago and in Jutland. Subgroup II.1 was almost exclusively found on Fyn, while the three other subgroups were almost evenly distributed along the eastern half of the Jutland peninsula. Finally, Laursen discussed the chronology of the brooches, and referring to some recent Danish finds and to large, published cemeteries from Holstein, he reached the conclusion that the bulk of the brooches should be dated to (an early part of) Becker's per. IIIa (Becker 1961), i.e., equivalent to my phase IIA (Martens 1996). He found no support for Erling Albrechtsen's claim that some ball brooches may be dated to Becker's per. II (Albrechtsen 1954, 96-97; 1973, 75-76).

The treatise of Laursen to a great extent sums up the state of research on this topic in Denmark. The problem with the paper is its character of a summary or even an abstract of a not published larger work. The data behind the study is not revealed. A glimpse of the size of the material is revealed in the remark that the number of brooches of group I exceed 60 specimens alone from the island Bornholm (Laursen 1984, 133). To this must be added that artefacts from the late Pre-Roman Iron Age are numerous on this island, while they are almost absent from the Zealand islands. There is, however, no reason to believe that there were similar numbers hidden behind the subgroups of his second group. Still, in his discussion of the distribution patterns of the different groups and subgroups, Laursen limited himself to the published specimens.

Laursen's paper was published at a time when hobby metal detecting was only at its early stages in Denmark. Therefore, this hobby had not yet had its

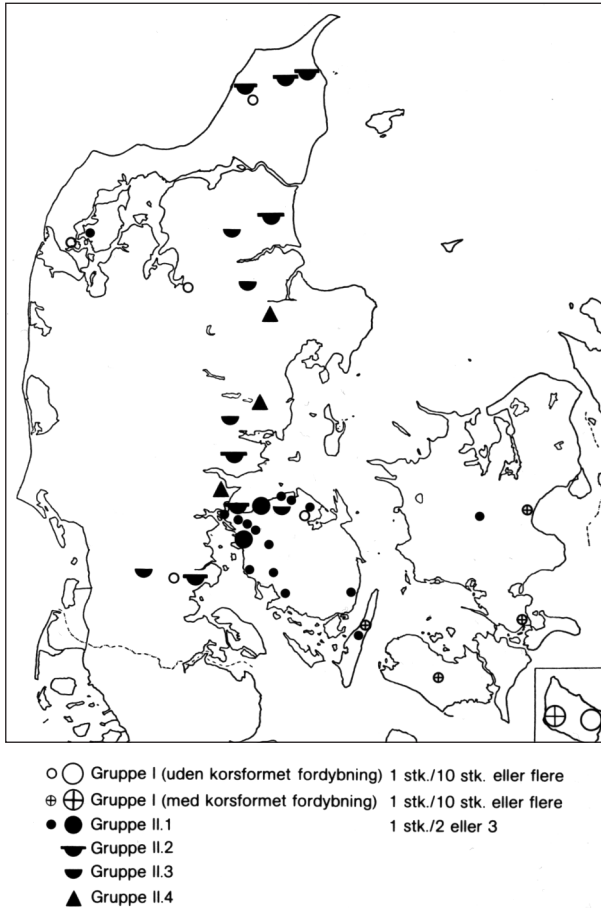


Fig. 2. Jesper Laursen's distribution map of ball brooches, after Laursen 1984, fig. 16.

impact on the material. Metal detecting favors objects with much metal and since cultivated soil contains a lot of iron waste most hobby detectorists tend to screen for iron. Consequently, objects of bronze, silver and gold will have a tendency to dominate the finds brought in by these people, and especially massive objects. Thus, ball brooches, especially the cast bronze specimens, would have a good chance to be detected and collected.

This seems to be the case. From 1985 to 2001, the National Museum annually published a survey of Danefæ (treasure trove) delivered to the museum, and from time to time, ball brooches are mentioned among the incoming artefacts. These reports were published in the periodical *Arkeologiske Udgravninger i Danmark*. Unfortunately, this periodical was liquidated in 2002, and



for a longer time afterwards there was no single place to look for these data. As the internet developed, some private sites were established where the finders themselves published their finds, like for instance <http://www.fibula.dk/index.php>. There was, however, growing concern among professionals about the lack of insight into this rapidly expanding material, since most museums did not have the capacity to process everything that was handed in and send it to the National Museum for Danefæ evaluation.

In 2014, a group of archaeologists at the University of Aarhus therefore took the initiative to develop a publicly accessible database in which the finders could register their finds, including GIS-information, photos and their own description and dating of the artefacts (Dobat et al. 2019). The latter was done in the recognition and acknowledgement of the large pool of artefactual knowledge that has accumulated between the more active hobby archaeologists over the years (Dobat & Jensen 2016). The idea was that the metal detectorists could register as users on the site and with an app on their cell phones upload GIS-information as well as photos of the find, and the find spot, and then or later supply this with further information, for instance about type and material. Thus, the museums would have a real-time overview over what was going on in their districts as well as accurate information about the finds and their finders.

The app named DIME was launched in September 2018 (Dobat et al. 2019) and until today (29.09.2021) 121.186 finds have been registered by private users in the database (<https://www.metaldetektorfund.dk/>). To enter a find in the base one has to be registered and logged on. The user will then be able to see his or her finds and the data linked to them in their totality. He or she will, however, not be able to see the full dataset of other finds, only the most general (photos and information about in which municipality it was found and when it was registered as well as a short description). This was done to prevent the base from becoming a guide to treasure hunters. The archaeological museums on the other hand can access the full dataset but only of finds made in their own district. Originally it was planned to design a special gateway for researchers, but this has not been done yet.

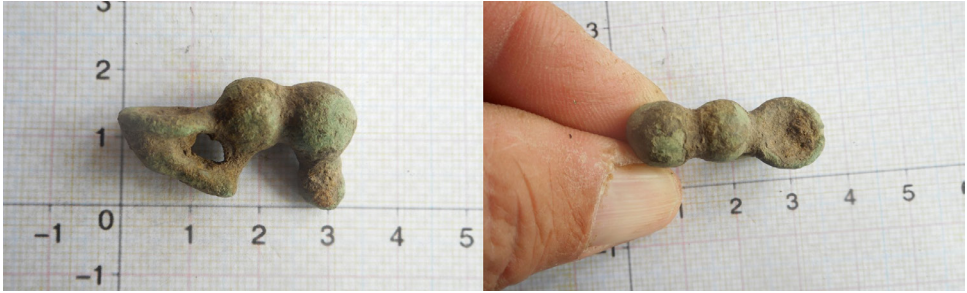
All entries get a unique registration number. Unfortunately, unlike its British counterpart the Portable Antiquities Scheme (<https://finds.org.uk/>), there are no professionals checking the entries and there are no links to what happens to the artefact after the registration in the database. Thus, the base offers an insight into what is being found but not a key to where the artefacts are being kept. Due to the liberal administration of the Danish heritage legislation, some objects entered into the database may remain in private possession. Hence, one of the strengths of DIME is that it includes all finds, even those not acquired by a museum.

DIME is open for anyone to browse. To an unregistered visitor it offers various search options, but GIS-wise only at the level of municipality. However, this level of detail may actually be good enough in many cases, especially when operating on a national or international scale.

The search options offered by DIME are several, ranging from self-defined words to pre-chosen typological or chronological terms. Among them one can choose terms like “late Pre-Roman Iron Age” or “ball brooch”. On the morning of September 30th 2021, the term “Pre-Roman Iron Age” returned 164 entries. However, a quick glance through the resulting list demonstrated that several entries were not from the Pre-Roman Iron Age but from later periods. A better and more reliable way to use the base is therefore to search on easily recognizable object types like “ball brooches”. Under this category, a search on the same date gave 96 entries. A study of the attached photos confirmed the determination in most cases and only in one instance it can be proven that it is wrong, since this particular fragment (DIME 66498) appears to be part of a brooch of a local derivative of Kostrzewski’s type K. A quick perusal through the entries under the term “Pre-Roman Iron Age” reveals that among the 164 items there were only four brooches from the Late Pre-Roman that are not ball brooches (DIME 129816, 109274, 43649, 31844). These four specimens appear to be fragments of bronze brooches of local derivatives of Kostrzewski’s type K. Furthermore, there were two ball brooches which had not been registered as such (DIME 20525, 13706). To conclude, when it comes to easily recognizable artefacts the database appears to be rather reliable.

The photos in the database are provided by the finders (fig. 3). There are no specific rules concerning quality or angles or number of photos. Some finders only load one up, others several, some load up photos from the find situation, others from when they have cleaned and identified the object at home. There are thus limits to how detailed a study one may carry out basing solely on the database. Still, it is much better than nothing, since every object is documented by at least one photo. What lacks is the link to what happens next with the object; is it entered into a museum collection and in that case under which registration number, et cetera? This makes it hard if not impossible to follow up with a physical study of the objects. However, such features are projects for the next generation of the database which is still a work in progress.

With more than 120.000 entries since the opening in 2018, i.e. within just three years, DIME can only be designated as a success. When it was launched, the staff behind it was not certain whether people would use it at all, primarily because of the private bases already on the net. A closer look at the distribution of the ball brooches in the base gives an indication of how well it has been



3a. DIME 1802, Laursen type II.2 from Odder, East Jutland.



3b. DIME 71292, Laursen type II.3 from Brønderslev, Vendsyssel.



3c. DIME 94390, Laursen type I from Sønderborg, South Jutland.

3d. DIME 113700, Laursen type I from Frederikssund, Zealand.

Fig. 3. Examples of photos of ball brooches uploaded to DIME.

received, but also an indication of that the reception does not appear to be the same every where. From Laursen's paper we learned that in 1984 there were already known more than 60 ball brooches from the island of Bornholm. In the present survey this island is only represented by three specimens while other municipalities, which earlier did not impress by high numbers, during this short period of time have delivered from five to eight brooches. That this does not mean that the Pre-Roman Iron Age sites on Bornholm are exhausted on

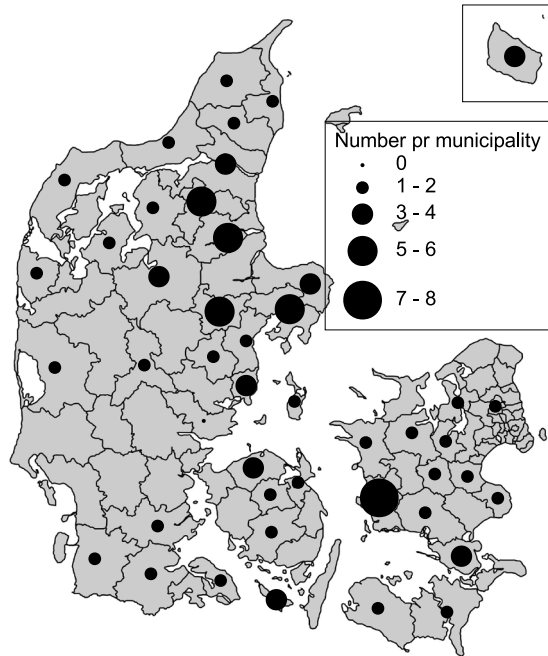


Fig. 4. Map base on appendix 1, data retrieved from DIME on September 29th 2021, graphics by J. Martens, based on appendix 1.

the island is indicated by the steady flow of new finds mentioned in the annual reports published by the National Museum from 1985 to 2001. The low number registered in DIME could therefore be interpreted as an indication that the metal-detectorists on Bornholm are a little reluctant towards using the database. However, island is represented with a total of 480 finds dated to the Iron Age, a number which is well above average, so there must be another explanation to the apparent lack of finds. An alternative explanation may be the fact that the ball brooches of East Denmark usually were made of iron, often with balls made of bronze. Iron has a lesser chance to survive in the increasingly acid soils of our era, and furthermore many detectorists screen for iron to avoid the modern scrap metal that pollutes our agricultural soils.

It is interesting to make a comparison between the distribution map of Laursen with a map based on the finds in DIME (fig. 4). On Laursen's map there are large blank areas with no or nearly no finds at all. In Jutland the brooches concentrate in a relatively narrow 50 km wide strip along the east coast, while the western and central parts of the peninsula are almost without finds. This pattern is repeated in the DIME-material, though a few brooches have been

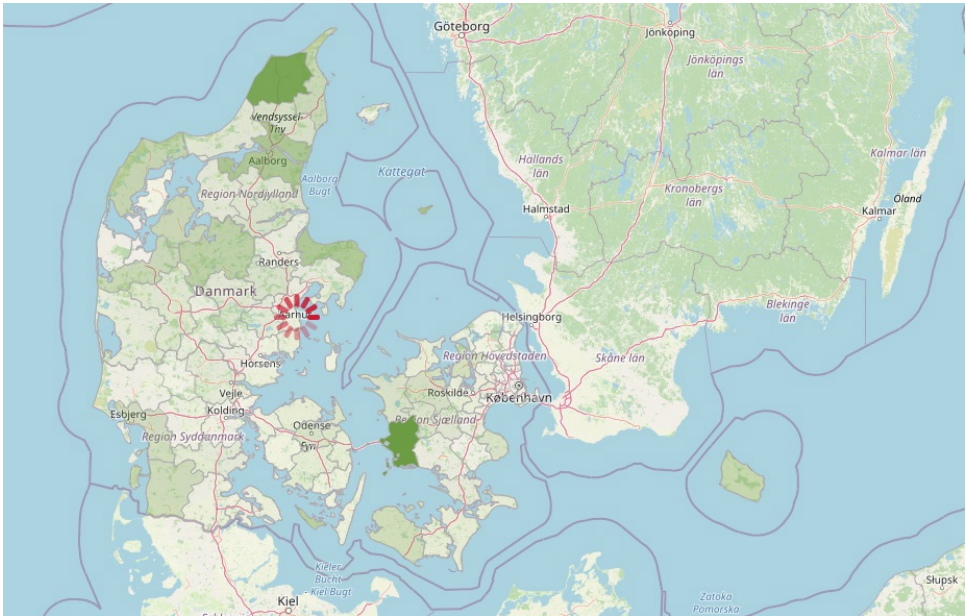


Fig. 5. Map copied from the DIME home page showing the density of Iron Age finds registered in the database pr municipality, status September 29th 2021. The darker the green, the more finds are registered.

registered in the western part of the peninsula. This could be a result of several factors, the most obvious being that it reflected search intensity.

A way to check this is to compare the distribution of ball brooches to the distribution of all finds registered in the database dated to the Iron Age. On September 29th 2021, the grand total of objects dated to the “Iron Age” were 15601 entries from the whole country. Since Denmark is divided into 98 municipalities, this gives an average of 159 finds pr municipality. DIME offers a map-based search option, and though it only can return data on the municipality level it still gives an impression of the distribution of the finds (fig. 5). The map shows that some of the municipalities with more than average numbers of detector finds from the Iron Age are actually situated in West Jutland, for instance Thisted (492 finds from the Iron Age registered in DIME), Holstebro (426), Esbjerg (352), Tønder (388). Despite this, these municipalities are only represented with a few ball brooches. This can be compared to the three East Jutland municipalities Rebild (204 registered finds from the Iron Age in DIME), Mariagerfjord (261), and Favrskov (273). These municipalities have each produced 5-6 brooches but are in general represented by much fewer finds in the database than the mentioned municipalities of West-Jutland. Basing on this it seems that the relative lack of ball brooches in West Jutland reflects a prehistoric reality.



Fig. 6. The distribution of graves from the Late Pre-Roman Iron Age, status 1980 (Liversage 1980, fig. 21). Each dot represents a single grave.

It is obvious that this analysis could have been taken even deeper, taking into account the size of each municipality and the land use, since detector finds are primarily done on cultivated land and not in forests or built-up areas. Thus the 13 municipalities with more than 1000 inhabitants per square kilometer in the capital area ought to be left out of the average calculation, since they are practically built-up. Furthermore, if the data had been accessible, the number of active detectorists in the individual municipalities would also have been a factor to calculate with.

In East Denmark the situation is markedly different. Laursen mapped only three brooches on Zealand and one on Lolland. In the DIME material which has been collected during only three years, 28 specimens or 29% of the total number of brooches were found on these islands. This is not only in stark contrast to the previous distribution pattern but also to the known number of graves from the Pre-Roman Iron Age (fig. 6) (Liversage 1980, 39-40, fig. 21). It gives us a sharp warning against interpreting a lack of graves as an indication of a lack of population. This observation is confirmed by the many large-scale development driven settlement excavations carried out on the island during the last three decades. The Pre-Roman Iron Age represents a prominent part of this material, an observation backed by the numerous Celtic field systems preserved in the forests of Zealand (Boye ed. 2011; Boye 2019, Nielsen 2010, see also Martens 1998, 251-252, figs. 8,

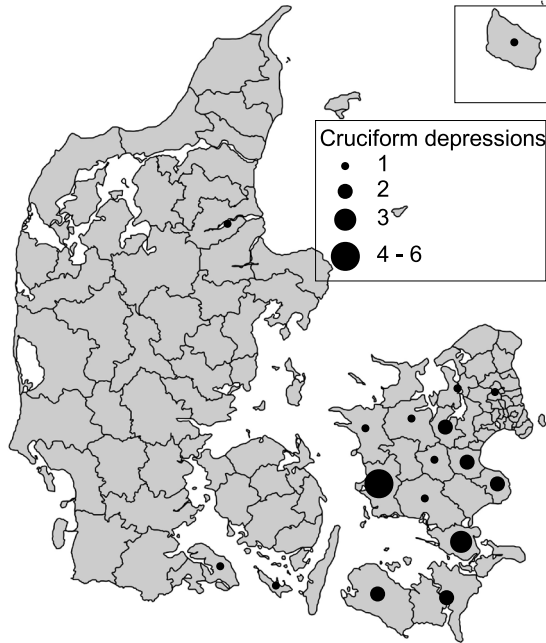


Fig. 7. Distribution of ball brooches with central cruciform depression on the balls, graphics by J. Martens, based on appendix 1.

9 and 13). The reasons why our knowledge of the Pre-Roman Iron Age on Zealand has changed so dramatically are thus many, metal detecting just being one. Earlier theories of a longer lasting Bronze Age or a deserted period have been disproved. Instead a picture emerges of an Iron Age slightly differently organized than the one in the western parts of Denmark, more related to the Pre-Roman Iron Age in Scania and Scandinavia than to the continent (Martens 2020)

However, despite the extreme growth of the material from Zealand, the typological observations made by Laursen still seem to hold true. The balls of the brooches of the Zealand islands are almost all (25 out of 28) ornamented with a central cruciform depression (figs. 3d, and fig. 7). This ornament is rarely found in the material to the west of Store Bælt. Only two of the 55 specimens found in Jutland and one of the 11 from Fyn are ornamented in this way. Interestingly, the specimen from the Fyn archipelago was found on the southern island Ærø (DIME 24817), while one of the two brooches from Jutland was found on Als (DIME 94390, fig. 3c). This appears to be along an ancient communication route also known from the Early Pre-Roman Iron Age (Martens 2011, 168-171). If the brooches represent destroyed graves, they may indicate exogamy along this route.

Another of Laursen's observations which is confirmed by the DIME data is that the brooches of East Denmark tend to be made of iron with balls of bronze. At least this must be the explanation for the fact that while the brooches in West Denmark either are next to complete or consist of a larger fragment of the bow and/or foot (fig.8a), then none of the 28 specimens from Zealand were found in a nearly complete condition. In fact, 12 were only represented by their balls (fig. 8b). This is a strong indication that the brooches were of iron which has corroded away during the stay in the increasingly acid conditions of our soils.

The bulk of the brooches from Jutland can be ascribed to Laursen's sub-types II.2 and II.3, while apparently there are no new specimens added to his third group II.4. A brooch from Thisted municipality (DIME 77382) is of particular interest since its front is shaped like a bull's head (fig. 9). This brings it into an exclusive group of brooches with zoomorphic attributes (Faber 1969, Martens 1999, 59-62, fig. 18-19). Apart from the head it is a typical representative of Laursen's type II.2 which is a local type.

As on Zealand, graves from phase IIA are rare in Jutland (Becker 1961; Martens 1998b, 173-176). If one accepts Laursen's dating of the ball brooches, then the brooches may indicate destroyed graves from this period. This assertion is based on the fact that though a number of well preserved Late Pre-Roman Iron Age settlements were excavated manually during the early half of the 20th Century, none of them produced brooches (see for example Hatt 1938). In fact, metal objects are rarely found on settlements from the Pre-Roman Iron Age in Denmark. Therefore, it is more likely that the brooches come from ploughed-up graves. If this is the case, then the brooches indicate a completely different distribution pattern than the actual graves known from the Pre-Roman Iron Age in general and from phase IIA in particular, since they concentrate on the fat soils of East Jutland. Again, modern development-driven settlement archaeology confirms this picture, indicating that the heavy clay soils of East Jutland were no obstacle to the Pre-Roman farmer, rather the opposite (Runge 2014; Martens 2020).

The reason why preserved graves from the period are so rare in this area may be that they were single, unmarked, isolated graves. like what has been documented from other areas such as Himmerland and Vendsyssel (Martens 1998b, 159-164). This made them hard to discover before they were destroyed by agricultural cultivation. That such graves were discovered in Himmerland and Vendsyssel is because in these landscape larger parts of the cultivated land went out of use or rather was turned into heather during the later Iron Age and was not brought under plough again before the end of the 19th or the start of the 20th Century. This, in combination with farmers with an archaeological interest, secured the information of these fragile monuments in certain micro

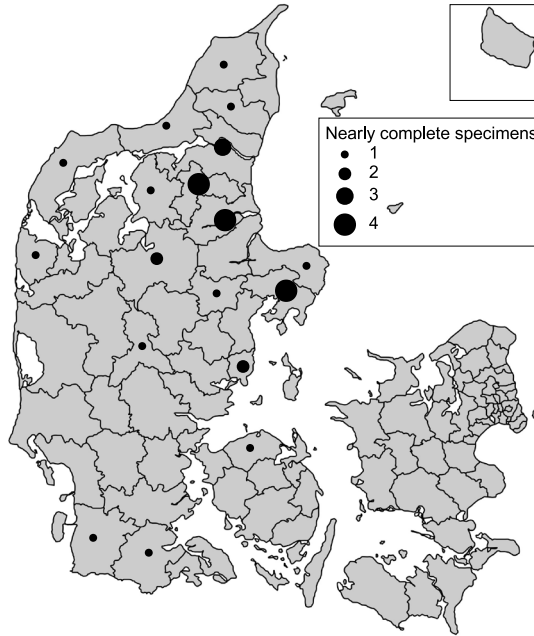


Fig. 8a. The distribution of nearly complete ball brooches, graphics by J. Martens, based on appendix 1.

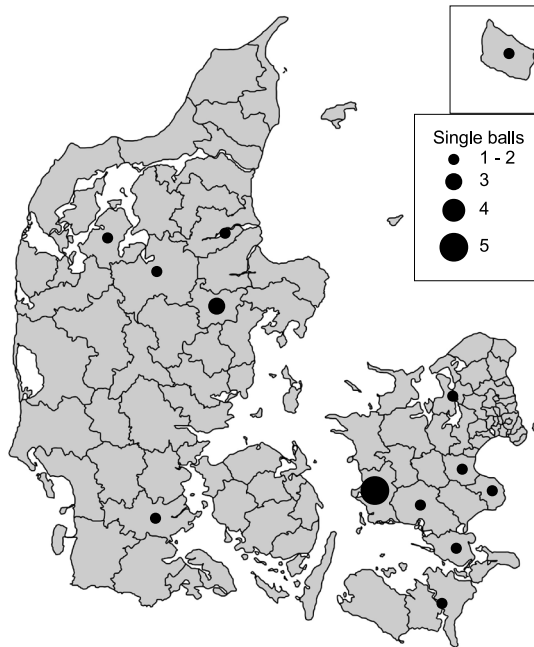


Fig. 8b. The distribution of ball brooches only represented by their balls, graphics by J. Martens, based on appendix 1.



Fig. 9. The bull faced brooch DIME 77382 from Thisted, Northwest Jutland.

regions. The ball brooches may therefore give us an insight into a Prehistoric reality that otherwise has escaped us. Bearing in mind that metal objects and especially brooches are rare goods in graves from the period, then the 55 Jutland brooches may in fact represent at least a tenfold of lost graves, and though this number may still seem low, one must take into account that the material has been collected over a period of only three years.

As a final point, the numeral relation between ball brooches and other types of brooches from the Pre-Roman Iron Age; 97 versus 5 cannot be taken at face value as a reflection of a prehistoric reality. Due to their massive balls, they are much easier to detect with a metal detector than the more delicate types of brooches of the period. This is even more the case concerning the massive bronze ball brooches of Jutland (figs. 3a-b and 9).

The reservations taken above should not intimidate researchers from using DIME. This amazing new tool offers a gateway into the ever-growing mass of detector material. And after all, any archaeological material must be treated with source critique. Furthermore, modern archaeological excavations are driven by development projects which tend to concentrate around population centres, while metal detecting is depending on open fields. In this way the two source groups are complementary and enhance our possibility to reach for the prehistoric reality.

Concluding remarks

Though the DIME database in its present form does not allow for deeper typological studies or detailed GIS-based analysis without help from the administrators, it still allows us to draw some important conclusions on a more general level. Ball brooches appear to have been relatively common during the early part of the Late Pre-Roman Iron Age all over the territory covered by the database, though the brooches are not evenly distributed. Furthermore, the



distribution patterns that emerge from the database appear not only to reflect the search intensity in the different parts of the country, but also and more importantly a Prehistoric reality. Even typological studies on a general level can with some limitations be made in a meaningful way. The database thus offers a new and completely different kind of access to a material that hitherto to a great extent has been inaccessible to most, and very hard to collect even for the most dedicated researchers. Citizen science has thereby proved its potential. What remains to be seen while waiting on the next generation of the database is what the impact will be when comparing the data with the archaeological records of other territories with different heritage legislations, different data access and a different relations between the heritage management authorities and the public.

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Appendix

Municipality	DIME id	date	Condition	Number of balls	Ornamentation	Corrections	Landscape
Bornholm	124148	20210502	frag. of bow	two			Bornholm
Bornholm	88752	20200905	frag. of bow	one	large shell		Bornholm
Bornholm	57728	20200119	single ball	?	cruciform depression		Bornholm
Brønderslev	71292	20200405	nearly complete	three			Jutland
Favrskov	134150	20210906	single ball	?			Jutland
Favrskov	111655	20210228	single ball	?			Jutland
Favrskov	70480	20200402	single ball	?			Jutland
Favrskov	51758	20191130	frag. of bow	three	"eyes" on the sides		Jutland
Favrskov	28073	20190419	nearly complete	three			Jutland
Frederikshavn	3214	20180920	frag. of bow	three			Jutland
Frederikssund	113700	20210312	single ball	?	cruciform depression		Zealand
Frederikssund	85653	20200819	frag. of bow	two			Zealand
Furesø	90393	20200912	frag. of bow	two	cruciform depression		Zealand
Faaborg-Midtfyn	7714	20180930	frag. of bow	two			Fyn
Guldborgsund	87153	20200829	single ball	?	cruciform depression		Zealand
Guldborgsund	86966	20200826	single ball	?	cruciform depression		Zealand
Haderslev	100888	20201112	single ball	?			Jutland
Hedonested	66498	20200319	frag. of bow			K-brooch	Jutland
Hjørring	35479	20190806	nearly complete	three			Jutland
Holbæk	20525	20150909	frag. of bow	three	cruciform depression		Zealand
Ikast-Brande	92710	20200922	nearly complete	two			Jutland
Jammerbugt	3798	20180924	nearly complete	two			Jutland
Kalundborg	64002	20200304	frag. of bow	one	cruciform depression		Zealand
Kerteminde	25228	20190404	frag. of bow	two	dotted circles		Fyn
Køge	115236	20131117	single ball	?	cruciform depression		Zealand

Municipality	DIME id	date	Condition	Number of balls	Ornamentation	Corrections	Landscape
Køge	93963	20110924	frag. of bow	two	cruciform depression		Zealand
Lejre	72348	20200408	frag. of bow	two	cruciform depression		Zealand
Lejre	59301	20200130	frag. of bow	two	cruciform depression		Zealand
Lemvig	123634	20210429	nearly complete	three			Jutland
Lolland	96349	20201003	frag. of bow	two	cruciform depression		Zealand
Lolland	51974	20191201	frag. of bow	one	cruciform depression		Zealand
Mariagerford	75330	20200418	nearly complete	three	"eyes" on the sides		Jutland
Mariagerford	62223	20200220	single ball	?			Jutland
Mariagerford	60463	20200207	single ball	?	cruciform depression		Jutland
Mariagerford	59687	20200202	nearly complete	three			Jutland
Mariagerford	7079	20181024	nearly complete	three			Jutland
Mariagerford	7077	20181024	nearly complete	three			Jutland
Norddjurs	135604	20210914	nearly complete	two			Jutland
Norddjurs	42830	20190926	frag. of bow	two			Jutland
Norddjurs	26637	20190409	frag. of bow	one	"eyes" on the sides		Jutland
Norddjurs	137972	20210925	frag. of bow	three			Jutland
Nordfyn	120363	20210413	frag. of bow	three			Fyn
Nordfyn	119546	20210409	frag. of bow	two			Fyn
Nordfyn	55997	20151018	nearly complete	three			Fyn
Nordfyn	54258	20191226	frag. of bow	two	"eyes" on the sides		Fyn
Næstved	43759	20191002	single ball	?	cruciform depression		Zealand
Odder	117605	20210331	frag. of bow	two			Jutland
Odder	39212	20190907	nearly complete	two	horned		Jutland
Odder	1802	20171203	nearly complete	two			Jutland
Odense	41996	20190811	frag. of bow			uncertain	Fyn



Appendix

Municipality	DIME id	date	Condition	Number of balls	Ornamentation	Corrections	Landscape
Odense	1931	20180310	frag. of bow	two			Fyn
Rebild	59452	20200201	nearly complete	three			Jutland
Rebild	33616	20190617	nearly complete	two			Jutland
Rebild	29840	20190501	nearly complete	two			Jutland
Rebild	15141	20190121	nearly complete	two			Jutland
Rebild	13706	20190106	frag. of bow	two			Jutland
Ringkøbing-Skjern	131330	20210822	frag. of bow	two			Jutland
Ringsted	124136	20210502	frag. of bow	two	cruciform depression		Zealand
Samsø	119289	20200906	frag. of bow	two			Jutland
Skanderborg	128314	20210623	frag. of bow	three			Jutland
Skive	62848	20200224	single ball	?			Jutland
Skive	53184	20191216	frag. of bow	two			Jutland
Slagelse	69145	20200328	frag. of bow	two	cruciform depression		Zealand
Slagelse	68926	20200328	single ball	?	cruciform depression		Zealand
Slagelse	61777	20190912	single ball	?	cruciform depression		Zealand
Slagelse	51915	20191201	single ball	?			Zealand
Slagelse	37863	20190828	frag. of bow	two	cruciform depression		Zealand
Slagelse	22823	20190322	frag. of bow	two	cruciform depression		Zealand
Slagelse	22324	20190223	single ball	?			Zealand
Slagelse	17386	20180223	single ball	?	cruciform depression		Zealand
Stevns	92463	20200920	frag. of bow	two	cruciform depression		Zealand
Stevns	51328	20191125	single ball	?	cruciform depression		Zealand
Syddjurs	132642	20210829	nearly complete	three			Jutland
Syddjurs	88178	20200901	nearly complete	three			Jutland
Syddjurs	84409	20200806	nearly complete	two			Jutland

Municipality	DIME id	date	Condition	Number of balls	Ornamentation	Corrections	Landscape
Syddjurs	137454	20219824	frag. of bow	two			Jutland
Syddjurs	137519	20210924	nearly complete	two			Jutland
Sønderborg	94390	20200930	frag. of bow	two	cruciform depression		Jutland
Thisted	77382	20200427	nearly complete	two	bull's head		Jutland
Thisted	41520	20190920	frag. of bow	two			Jutland
Tønder	91541	20200917	frag. of bow	one			Jutland
Tønder	91539	20200917	nearly complete	two			Jutland
Vesthimmerland	87521	20200830	frag. of bow	two			Jutland
Vesthimmerland	49456	20191110	nearly complete	two			Jutland
Viborg	65121	20200313	nearly complete	three			Jutland
Viborg	33842	20190620	single ball			uncertain	Jutland
Viborg	26791	20190411	nearly complete	two			Jutland
Vordingborg	46015	20191015	single ball	?	cruciform depression		Zealand
Vordingborg	39042	20190906	frag. of bow	two	cruciform depression		Zealand
Vordingborg	38819	20190904	frag. of bow	two	cruciform depression		Zealand
Ærø	76943	20200425	frag. of bow	two			Fyn
Ærø	24817	20190331	frag. of bow	two	cruciform depression		Fyn
Ærø	7561	20180828	frag. of bow	two			Fyn
Aabenraa	25920	20190407	nearly complete	two			Jutland
Aalborg	90341	20200901	nearly complete	two			Jutland
Aalborg	81521	20200602	nearly complete	three			Jutland
Aalborg	15994	20190129	nearly complete	two			Jutland
Aarhus	31341	20190512	frag. of bow	two			Jutland



Fibulele cu sfere în epoca Științei Cetățenești

Rezumat

Broșele cu sfere reprezintă o temă dificilă de cercetare în Danemarca. Acest fapt se datorează în mod special puținelor exemplare publicate până acum care ar fi fost descoperite într-un context sau în împrejurări care ajută la stabilirea cronologiei lor. Cel mai recent studiu publicat este o lucrare foarte scurtă a lui Jesper Laursen despre cronologia și tipologia fibulelor cu sfere (Laursen 1984). Lucrarea lui Laursen a văzut lumina zilei într-un moment în care detectarea metalelor era un hobby care abia se constituia în Danemarca și prin urmare, acesta nu avusese încă vreun impact asupra vestigiilor. De menționat că detectarea metalelor favorizează obiectele cu mult metal și, deoarece solul cultivat conține o mulțime de deșeuri de fier, cei mai mulți detectoriști tind să nu caute fier. În consecință, obiectele de bronz, argint și aur au avut tendința de a domina descoperirile aduse de acești oameni, și în special obiectele masive. Astfel, broșele cu bile, în special exemplarele din bronz turnat, ar avea șanse mari să fie detectate și colectate. Pe măsură ce internetul s-a dezvoltat, s-au înființat unele site-uri private unde cei care au găsit obiecte de metal, ei înșiși și-au publicat descoperirile. Mai mult, recent a fost lansată aplicația numită DIME (în septembrie 2018), iar până la data de 29.09.2021 în respectiva bază de date fusese înregistrate 121.186 de artefacte descoperite de către utilizatori privați. Informațiile nou disponibile, corelate cu cele anterioare, oferă posibilitatea unui studiu preliminar al broșelor cu sfere, pe care îl și propunem în acest articol.

Cuvinte cheie: Broșe cu bile; Danemarca, cronologie, tipologie, detectarea metalelor.

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